DOCUMENT RESUME

ED 072 268 VT 018 752

TITLE	The Target Industries: Profiles of Five Hazardous Occupations.
INSTITUTION	Occupational Safety and Health Administration, Washington, D.C.
REPORT NO	OSHA-2034
PUB DATE	[72]
NOTE	25p.; Reprints From Safety Standards
AVAILABLE FROM	Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (S/N 2915-0014; $.30)
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	*Industry; *Inplant Programs; Laborers; Labor Laws; *Labor Legislation; Pamphlets; *Safety; *Safety Education
IDENTIFIERS	Williams Steiger Act

ABSTRACT

To contribute to a fuller understanding and awareness of the hazards involved in industries as well as to call attention to steps being taken to solve safety problems, this pamphlet surveys five industries cited among those having the highest rates of job-related injuries in the country. Industries include: (1) Roofing and Sheet Metal, (2) Longshoring, (3) Lumber and Wood Products, (4) Meat and Meat Products, and (5) Mobile Homes and Transportation Equipment. With the passage of the Williams-Steiger Occupational Safety and Health Act of 1970, more stringent measures have been employed to protect workers. Some of these measures were: (1) management training programs, (2) stricter regulations regarding the wearing of protective clothing while working, (3) legislation aimed at better working conditions, and (4) the use of safety experts as members of a standing committee to assist employers when necessary. (SN)

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THE TARGET INDUSTRIES

PROFILES OF FIVE HAZARDOUS OCCUPATIONS

U.S. DEPARTMENT OF LABOR
OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

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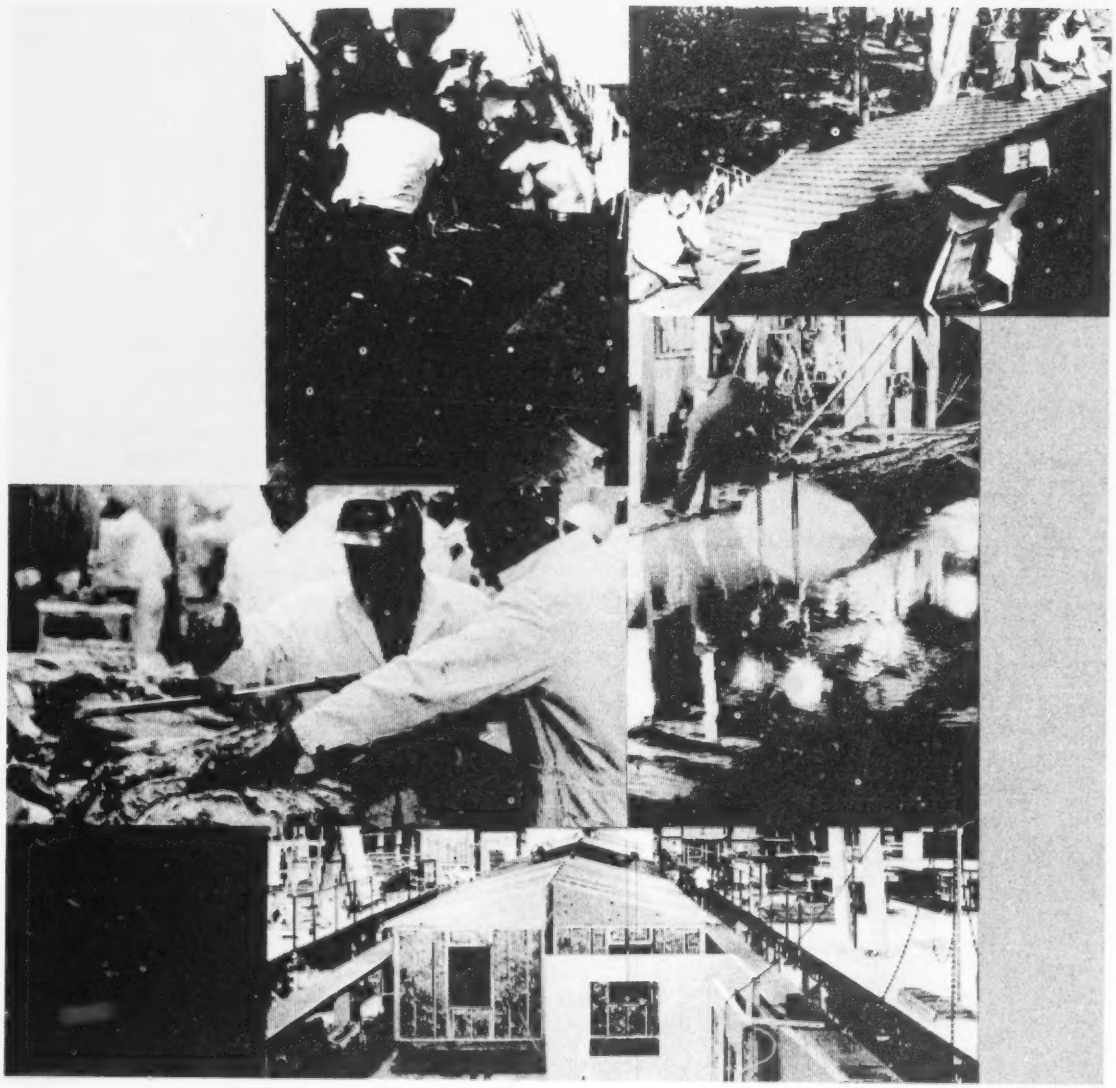

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REPRINTS FROM SAFETY STANDARDS
OSHA 2034

THE TARGET INDUSTRIES

Shortly after the passage of the Williams-Steiger Occupational Safety and Health Act of 1970, the Department of Labor launched the Target Industry Program. Its purpose was to focus attention on five industries with high rates of job-related injuries. Although many companies within each industry had good safety records, the industries as a whole had injury rates at least double the national average of 14.8 disabling injuries per million man-hours worked. The five industries designated as "target industries," and their injury-frequency rates:

- Longshoring–69.9;
- Roofing and sheet metal–43.0;
- Meat and meat products–38.5;
- Mobile homes and miscellaneous transportation equipment–37.6;
- Lumber and wood products–36.1.

Before announcing the Target Industry Program, OSHA officials met with key trade association and employee representatives from each of the industries. Each industry was asked to organize its own approach to reducing the injury rate as quickly as possible. The Occupational Safety and Health Administration agreed to supply training and consultative services. The National Safety Council, working closely with OSHA, assigned expert staff members to assist each target industry in developing programs for safety and health.

This pamphlet gathers together a series of articles from "Safety Standards" magazine on the target industries. Its purpose is to contribute to a fuller understanding of the industries by surveying the products they produce, the conditions under which they produce them, the safety problems they face and the steps they are taking toward solving them.

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U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration
Washington, D. C. 20210

For sale by the Superintendent of Documents, U.S. Government Printing Office
Washington, D.C. 20402 - Price 30 cents
Stock Number 2915-0014

Profile of an Industry:

Roofing and sheet metal

by Jim Champagne

As we start 1972, we know only slightly more about the injuries in the roofing and sheet metal trade than we did a year ago. It is not that the reasons why injuries take place have escaped us; nor is it that we have been unable to figure out ways to prevent the injuries. Slips and falls still account for a considerable percentage of the injuries incurred by roofing and sheet metal employees; burns still take their yearly toll; cuts are an accepted hazard of the profession; and the increasing use of electrical/power equipment has created new hazards.

It seems reasonable to assume that both management and unions, armed with such information, could have developed and initiated—either jointly or individually—preventive programs to insure the safety of the American worker. It also seems reasonable to assume that the federal and/or state governments could have passed legislation designed to minimize the possibility of accidents and injuries in the American workplace. The fact is that programs were developed and specific legislation such as the Walsh-Healey Act and a number of state codes dealing with hazards of the roofing and sheet metal trade were passed. Even these did not resolve the problem of the injury-frequency rate; indeed, certain industries consistently recorded inordinately high injury-frequency rates. Roofing and sheet metal is one of those industries.

A look at the available statistics for the 10-year period beginning with 1960 reveals an unfavorable injury-frequency rate which each year exceeded the rate for all manufacturing enterprises by at least 200 percent. While the work environment of both roofers and sheet metal workers differs drastically from that of laborers in the manufacturing trades, a hazardous environment by itself does not cause injuries, let alone frequent injuries. It is necessary, however, to describe this environment fully in order to determine what it is about the workplace of this nation's roofers and sheet metal men that makes their work extremely hazardous.

As is the case with other industries in the Target Industry Program, the materials with which these men work are often, in themselves, dangerous. The roofer uses bitumen, which is a tar heated to anywhere from 350 to 500 degrees Fahrenheit. Burns from spillage, spattering and splashing are the leading cause of injury to the roofer. The bitumen, which is in solid form, must be broken into chunks to be melted. These chunks must be carefully added to the heating kettle; otherwise the worker might be spattered by the already melted bitumen in the kettle. When filling the tar buckets, the worker is in danger of being splashed if the tap on the kettle is turned on too fast. Also, if the worker overfills the bucket, the hot tar can spill as it is carried or hoisted to the roof.

Workers carrying buckets on the roof are frequently exposed to conditions that might cause them to slip and/or fall, thereby splashing the hot tar on themselves or other workers. Moppers sometimes spatter hot tar both on themselves and on other workers. Frequently the hot bitumen fumes in the kettle ignite, endangering the kettlemen and other workers close by. Also the toxic fumes given off by the hot bitumen can result in fume poisoning and skin and eye injuries.

The sheet metal worker is required to work with thin, razor sharp, large sheets of metal. If he chooses not to wear gloves while handling this

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Mr. Champagne is a staff member of the division of publications, OSHA.

Perched precariously at the edge of the roof, the worker (upper left) has greatly increased the possibility of injury by not observing elementary safety practices. Below (left) workers carry and pour hot tar on the surface of a roof. Burns resulting from handling this material are a primary source of injuries for roofers. Below (right) workers on scaffolding need to be constantly alert and safety-conscious.

Roofing and sheet metal

continued

material, he unnecessarily exposes himself to the possibility of being lacerated. Wind makes the transport of these large metal sheets an extremely hazardous task that can result in severe cuts for one or more workers. Lifting stacks of these sheets is often the cause of muscle strain and groin pulls.

Sheet metal men must cut and prefabricate their own materials. Items such as saws, soldering irons, tongs, shears, pincers and punchers may be used. Each item, when improperly used, can—and does—cause cuts and punctures.

The use of portable power tools such as electrical drills has increased greatly in recent years. Correspondingly, injuries resulting from their use have also increased. The biggest problem in this area is "grounding." A current of only one-tenth of an ampere—sometimes even less—can be fatal. The obviously dangerous combination of metal and electricity requires equipment that meets safety regulations, as well as workers trained and alert to these hazards.

Danger of falls

Still, roofers and sheet metal men are not the only American workers who daily work with hazardous materials. For that matter, it would be difficult to argue that the materials most often used in SIC: 1761 are among the most dangerous used by this nation's workmen. There must be something else that accounts for the high injury-frequency rate. Perhaps it is the work environment itself. Roofing requires work to be performed at heights. The danger of falls resulting in either fatalities or severe injuries is ever present. The sheet metal worker often works at these same heights and is exposed to the same hazard. Both occupations often require work to be performed while the workers stand either on scaffolding or on ladders; the possibility of injury by falling is quite apparent.

To bring down the injury-frequency rate under conditions like these requires a concentrated effort on the part of all concerned. It requires that workers have available the safeguards and protections they need. It requires also that the workers *use* them.

Unfortunately, when danger becomes a part of the everyday routine, some workers, over a period of time, become indifferent or careless. Neither of these attitudes is unique to sheet metal workers or roofers. But given the environment in which they work and the materials they use, the consequences can be—and all too often are—disastrous.

Hard hats 110 degrees

One trade association executive laments the fact that in the case of all too many workers their "desire to have a good sun tan frequently outweighs their desire to be safe." While this might at first glance seem to be a rather flippant assessment of the problem, it is at least indirectly supported by other spokesmen for the industry. Bruce Martin of the National Roofing Contractors Association feels that "if we could only get the workmen to walk on the job with even a bare minimum of protective equipment, we could reduce our injury-frequency rate by nearly one-half."

James Hensley, Director of Legislative Affairs for the Sheet Metal and Air Conditioning Contractors National Association (SMACNA), counters this somewhat when he argues that "it is difficult to make a worker wear a hard hat and gloves when he is working on top of a building in the summer when the temperature might read 110 degrees."

This statement, however, does not deny that a part of the problem might well be that a number of workers are unwilling at any time to wear the necessary protective equipment, such as long sleeve shirt, high boots, long pants, hard hat and gloves. This indifference to basic safety precautions points again to the need for extensive safety training programs in the sheet metal and roofing industry.

A recent survey by the Bureau of Labor Statistics reveals that collective bargaining agreements tend to include relatively extensive provisions on general safety rules and regulations. These agreements, however, do not always contain provisions that are specific enough for this high hazard industry.

continued

"Unfortunately, when danger becomes a part of the everyday routine, some workers, over a period of time, become indifferent or careless."

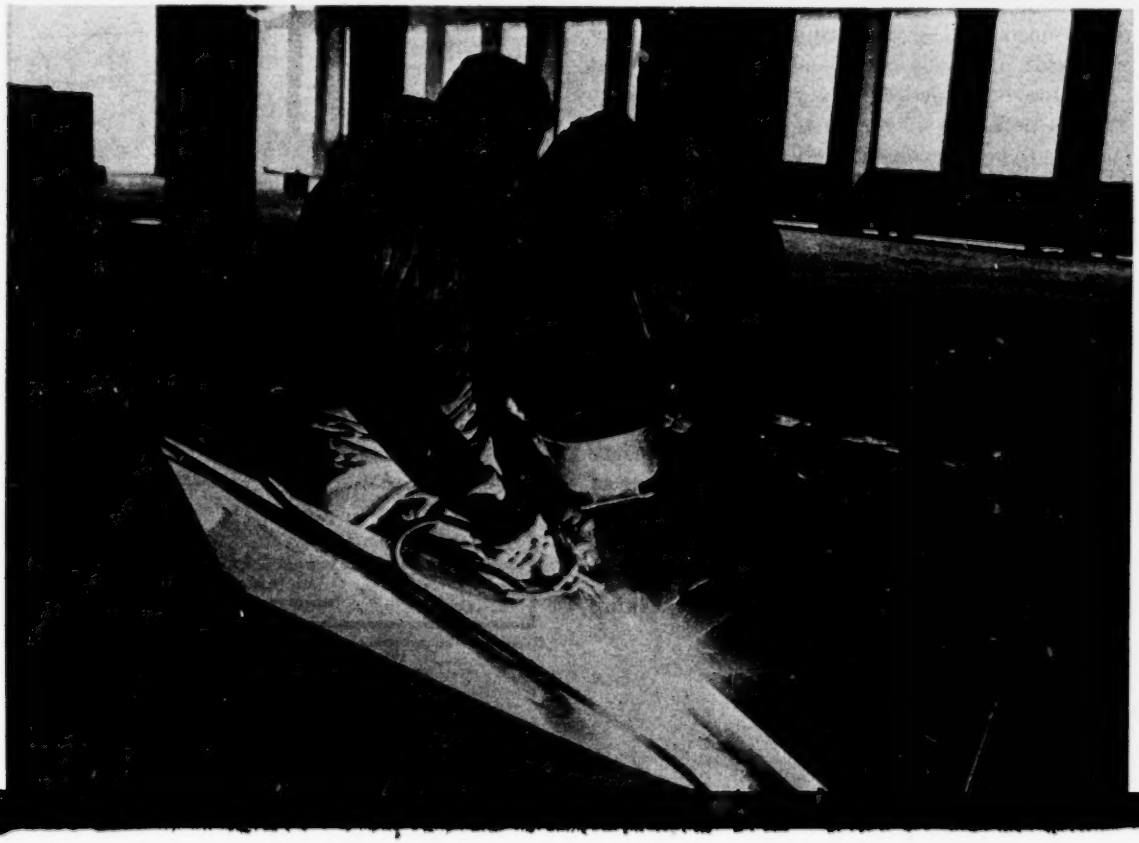
Perhaps, too, union contracts in the past have not put sufficient emphasis on safety. As one general contractor said, "If the union bargainer would exert one-tenth of the pressure for safety clauses that he does for pay increases and other wage benefits, we wouldn't have the problem we now have. Union members are satisfied with a negotiator who puts real money in their pockets. Safety features are just so much icing on the cake."

Then, too, contracts are negotiated job by job in many construction projects. As a result, there have been few real standards in the past that would apply in every instance. As an official for the Sheet Metal Workers International Association pointed out, "There aren't any minimum standards, really. The locals make their own standards or the local builders attempt to set standards. We furnish hard hats, glasses, and gloves. If the men don't use them, the men don't work. It's as simple as that." It thus appears that efforts are under way to combat worker indifference to protective clothing.

Unfortunately, no one has been able to overcome the indifference of some men to danger. The attitude that "it won't happen to me" is not uncommon among men who consider themselves rugged. Perhaps extensive training programs combined with a concerted, safety-oriented campaign will help influence workers to think safety. Though the motivation of self preservation is strong, there is no guarantee that it will surface in time to prevent an accident. The next vital problem is that indifference—for whatever reason it might exist—leads to the second issue: carelessness. Fortunately, to a certain extent, carelessness can be legislated against.

continued

Both men are sharing a single welder's helmet, thus exposing themselves to the possibility of severe eye damage. The improvised welding table—bracing the sheet metal against a tool box—demands that they kneel on the floor to perform their task. This hampers their ability to respond to any crisis situation.



Roofing and sheet metal

continued

If a worker fell through an opening in a roof; if he fell from the edge of a building; if he fell backward from a height because the ladder he was using was too short . . . if the hole on the roof had been covered or had a temporary guard built around it; if the perimeter of the roof had been fitted with a guard; if the ladder had only been longer; if . . . only.

Overcoming indifference

These are just some of the circumstances, needlessly repeated each year in industry, that prompted the passage of the Williams-Steiger Act. Such circumstances can be rectified. Section 1910.23 of the Occupational Safety and Health Act has established standards regarding floor and wall openings and holes. Sections 1910.25 and 1910.26 relate to ladders. Specific steps are being taken toward reducing conditions that allow careless activity to take its toll. These regulations represent a substantial step forward.

What is more important though, is that both management and unions are gearing up to meet standards and to promote—at considerable cost and effort—the idea of injury-free performance. This is necessary if the first problem—indifference—is to be overcome in industries such as roofing and sheet metal.

Steps forward

Good examples of the overall efforts being made are the extensive agreements that have been set up between the federal government and the eight states that are assisting OSHA in enforcing federal occupational safety and health standards in the target industries. Also the National Safety Council has been working with representatives of the roofing and sheet metal industry to help establish new standards and to help develop sophisticated safety programs aimed at achieving employer/employee cooperation in behalf of making the industry safe for everyone.

It seems clear that the problems of indifference and carelessness are under attack in the roofing and sheet metal industries. They have not yet been conquered. They might never be. The construction industry as a whole is the last vestige in our economy of custom-made, large-scale production. Its product is not mass produced. Fundamentally, both the materials and the job specifications are in many ways the same today as they were 50 years ago. In a way, this breeds contempt for any preoccupation with safety. The job has been done before; and though some men got hurt, most did not. It is difficult to convince those who need convincing that something could have been done to prevent those "some men" from getting hurt. The Williams-Steiger Act and its Target Industry Program are necessary steps. The success of these steps—as well as the success of union and management training programs—can best be measured by looking at the roofing and sheet metal industry in the years to come. □

"Yes, I did say report for work in protective clothing, however . . ."

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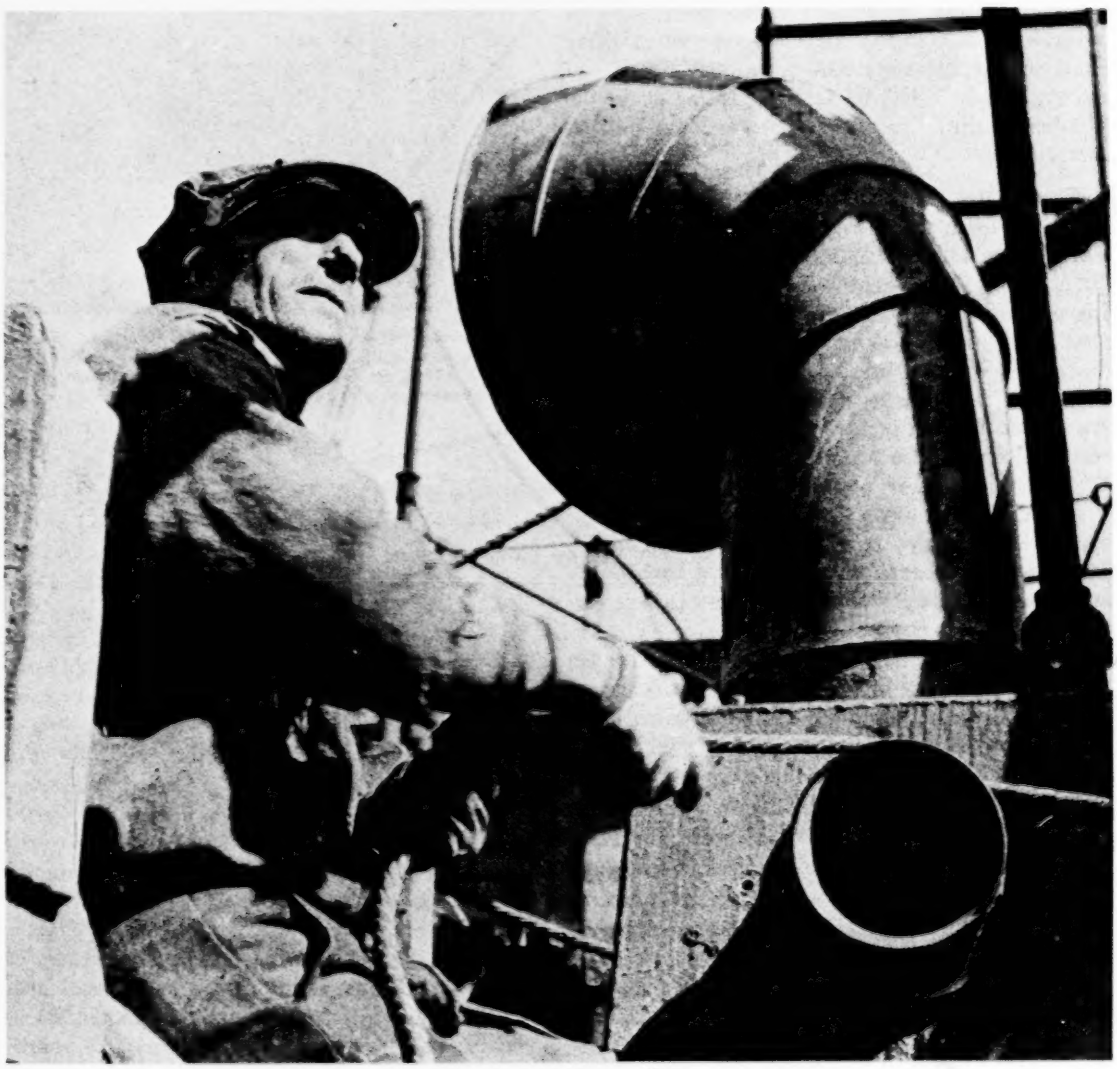
Profile of an Industry:

LONGSHORING

Rugged Work For Rugged Men



by William C. Russell

If you can imagine an office worker who must climb a ladder to his third floor office each morning and down the same way to get home in the evening, you may begin to have a general idea of the work environment of the American longshoreman. And a reason why his industry suffers a high degree of injuries when compared to other industries.

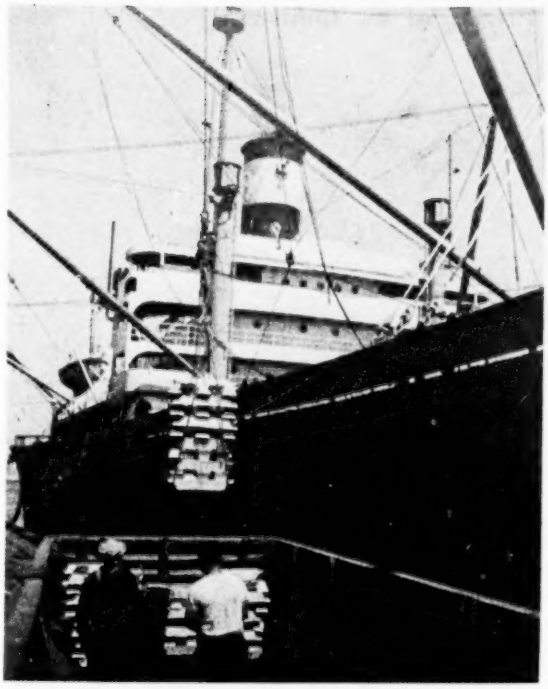
Stevedoring, or longshoring as it is more popularly called—the loading and unloading of a vessel's cargo—is rugged work for rugged men. And where there's rugged work there is often a certain amount of danger from accidents and injuries. In fact, according to the Bureau of Labor Statistics, longshoring suffered a 69.9 injury-frequency rate in 1969. This figure is based on the number of disabling injuries worked per million man-hours.

Nevertheless, Theodore R. Alff, chairman of the Management Advisory Cargo Handling Safety Committee (MACHSC—referred to as "MAXIE"), a national organization of stevedoring companies and shipping associations, believes that the industry has made remarkable progress since 1960 when Public Law 85–742 became effective. That year, he recalls, his industry reported 131.8 lost time injuries per million man-hours worked. In 1970 that figure had been reduced to 70.4 lost time injuries—a reduction of almost half!

It's Alff's contention that since reduction in the accident and injury rate is a cost over which the industry has control, it's imperative that every stevedore company reduce injuries so that it can remain in a competitive position.

Another factor which has contributed to the high rate of injury to longshoremen is the industry's employment practices. Although some large ports have joint hiring halls and rotational hiring, many longshoremen are hired on a casual basis and work for a number of employers for varying periods. Since longshoremen may work for three or more different employers in a week, it's obvious that this situation doesn't contribute to company loyalty or to the formation of a strong *esprit de corps*.

The MAXIE chairman also points out another reason why he feels longshoring has such a high injury rate. Public Law 85–472 required only the reporting of lost-time injuries of those workers on board a vessel. Alff stresses that the injury-frequency rate under this law is not a good indicator of the conditions in the industry. He points out that this figure did not include all of the man hours accrued on the piers and in the terminals where a lower accident frequency rate exists.



Aluminum ingots, cross piled and tiered and riding in a wire rope sling, are loaded aboard this vessel. Landing and hooking on load operations accounted for the fewest number of stevedoring injuries.

Edward March, chief of the maritime standards division of OSHA's Office of Safety and Health Standards, makes the interesting observation that stevedoring is a 100 percent materials-handling industry and therefore believes that it's unfair, he says, to compare it with land-based industries with their many low-risk employees.

While the Williams-Steiger Act provides for a much broader coverage of job safety and health protection, legislation for longshoring safety and health regulations goes back nearly 45 years to

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Mr. Russell is associate editor of SAFETY STANDARDS

"Safety meetings must be interesting and constructive, and any attempt to point blame should be strictly avoided."

March 1927 when the Longshoremen's and Harbor Workers' Compensation Act was passed by Congress. It was administered by the U.S. Employees' Compensation Commission.

The first safety code for stevedoring operations to be published in the United States was issued in 1928 by the waterfront employers of the port of Seattle. Later that year, the ports of San Francisco and Los Angeles jointly adopted a Foreman's Rule. In later months a number of other ports adopted safety codes including the port of New York in 1929.

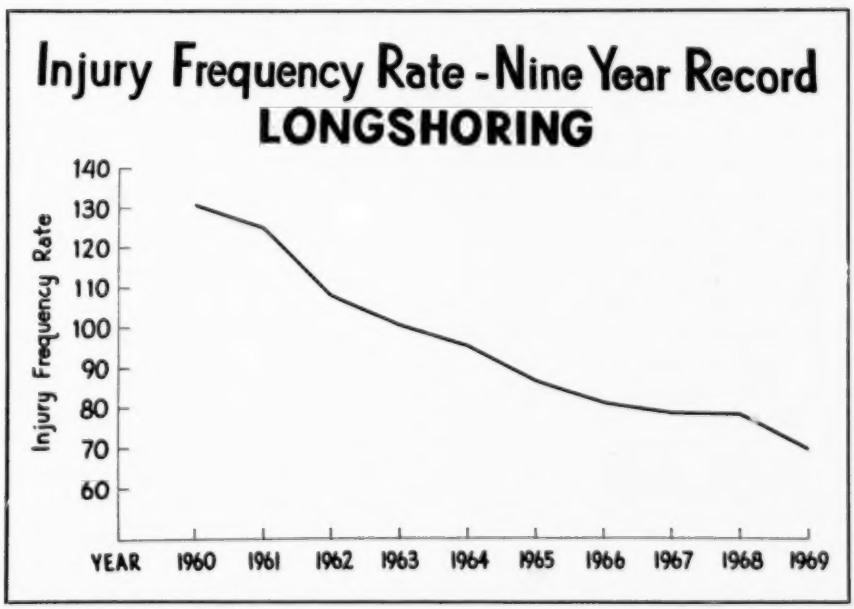
The U.S. Employees' Compensation Commission was abolished in 1946 and its functions transferred to the U.S. Federal Security Agency until May 1950. Administration of the Longshoremen's and Harbor Workers' Compensation Act then came under the control of the U.S. Department of Labor, with the functions and personnel relating to safety placed under the Director of the Bureau of Labor Standards.

LSB then had the right of entry to investigate accidents and the authority to advise stevedoring companies on safety matters, but little else. Only recommendations, consultation and training could be offered the industry.

Beginning in 1951 several bills had been introduced in Congress to provide safety measures for the longshoring industry. It was not until 1958 that the introduction of H.R. 13201 in the 85th Congress eventually resolved into Public Law 85–742. This amended Section 41 of the Longshoremen's and Harbor Workers' Compensation Act and extended to the Secretary of Labor the authority to develop a more realistic and effective approach to reduce injuries in the stevedoring industry.

The then-new law imposed a duty on employers to maintain safe conditions of employment and work practices. To carry out the intent of the bill, regulations for longshoring and harbor work had to be developed. In addition to administering the provisions of this section, the Secretary of Labor was authorized to provide safety training for employers and employees.

In the dozen years between the passage of Public Law 85–472 and the enactment of the Williams-Steiger Act of 1970, several significant pieces of



Bureau of Labor Statistics

Steady drop in longshoring injuries can be noted in this graph which illustrates the injury–frequency rate from 1960 to 1969.

legislation were enacted, including the Safety and Health Regulations for Longshoring and Ship Repairing. The regulations were published in the FEDERAL REGISTER and became effective on March 21, 1960. Periodic amendments to these regulations have been published and promulgated since.

In March 1963 the Gear Certification Regulations were published; they became effective on June 27, 1963. A year later, Safety and Health Regulations for Shipbuilding and Shipbreaking were published in the FEDERAL REGISTER for the first time and became effective.

And then came December 29, 1970, when President Nixon signed into law the Williams-Steiger Occupational Safety and Health Act. Safety and health in the nation's workplaces moved into a different dimension. But what about the new law so far as it pertains to longshoring? Is it any different from Public Law 85–472?

First of all, the standards remain the same, except for the continuing amendment process, states Ed March, whose office is charged with the development, research and promulgation of standards which pertain to the maritime industry. Maritime safety standards under the former law were effective immediately in places of employment covered by the Maritime Safety Act.

"The real differences are the penalties," comments John J. Klocko, chief of the materials handling technology section in the Office of Standards. He points out that the act provides for more severe penalties than the $3,000 maximum imposed by the old law.

Klocko, an LSB district supervisor in Chicago from 1959 to 1963 and assistant to the chief of the longshoring safety branch before the reorganization of the Bureau, said that enforcement previously consisted primarily of administrative action resulting in an occasional "cease and desist" order being issued to an employer. The Williams-Steiger Act provides stiffer penalties for failure to comply.

Another major difference today is that the Williams-Steiger Act has the authority to cover *all* harbor workers. Under the former law, federal authority applied only to those workers actually on board a vessel on the navigable waters of the United States. Dockside operations came under the jurisdiction of the state.

The Occupational Safety and Health Act now gives the Secretary of Labor the authority to enforce standards in all employment except for crews on the navigable waters. As Klocko points out, however, the present standards include only those hazards normally found on board a vessel and not on a dock. New standards are being written to protect the worker on the dock as well as the longshoreman aboard the ship.

Longshoremen still must "put their backs into it" despite some progress in mechanization. In 1970, 1,483 lost-time injuries from strains and hernias were reported.

Unpredictable Job

Why is longshoring so hazardous?

It's probably the unpredictability of the job itself. Each ship or barge and each cargo presents a different set of problems several times a day. One day a longshoreman may be handling fabricated steel—probably the most hazardous cargo to move around—and the next day he may be moving crates of bananas.

Specific hazards of longshoring, oddly enough, are not too different from many land-based injuries. Records show that from 1964 to 1970 slipping, tripping and falling led in number of longshoring injuries with 4,130 cases reported in 1970, though that year recorded a gradual decrease in the total number of longshoring injuries.

"Plain carelessness and inattention," John Klocko maintains, "is probably the main cause of most of these accidents. Employees," he added,

"We in the stevedoring industry are fighting for survival. We cannot continue to support the astronomical cost of injuries."

"are just as careless on board a vessel as they are walking around a plant or mill . . . or even in an office." However, as Ed March points out, "Longshoremen are in a much more hazardous environment."

Falling cargo, which one might expect to be the No. 1 injury-producer in longshoring, held down the No. 4 position on the list with a 1970 reported figure of 2,151. The second-worst accident category, according to the records, is cutting and pinching of limbs between cargo and tools. An analysis of these injuries shows that, at least so far as reported cases were concerned, the numerical injury rate has decreased appreciably since 1964.

Safety Programs

Now that we know what some of the problems are, what about solutions? What kind of safety programs are being conducted and promoted to make the longshoreman's work environment safer?

Ted Alff looks at it this way: "Each area, each pier, each terminal must have a program tailored to its particular needs. Incentives effective at one port have no value at another. Safety talks, which at one location are inspirational, fall on deaf ears or are misunderstood at another. Our most effective approach has been a totally fluid program or one which can be changed with the temperament of our men."

"Safety meetings," he emphasized, "must be interesting and constructive, and any attempt to point blame should be strictly avoided. New employees entering the industry should be given basic safety training and indoctrination."

"Films, slides, horror pictures of catastrophes should demonstrate the value of working safely in a safe workplace," Alff continues. "While first aid training emphasizes the effect of a careless moment, incentive programs have great value and merit consideration," he added.

Stressing that employers should get to know their men and get them involved in accident prevention, the MAXIE chairman also suggests that employers should try not to live in ivory towers and should refrain from discussing the monetary cost of injuries. "Instead," he adds, "they should emphasize the misery, inconveniences, mental anguish and the possible financial hardship caused to the families of the injured."

The wearing of protective clothing—hard hats, work gloves and safety shoes—is becoming more common throughout the longshoring industry.

While many ports and companies have already instituted their own safety efforts and have done so years ago, according to March, the Secretary of Labor has put into effect major amendments to the 1970 Safety and Health Regulations which provide for similar safety protection in all ports throughout the United States Amendments include the safety hat protection which became effective on July 28, 60 days after publication in the FEDERAL REGISTER.

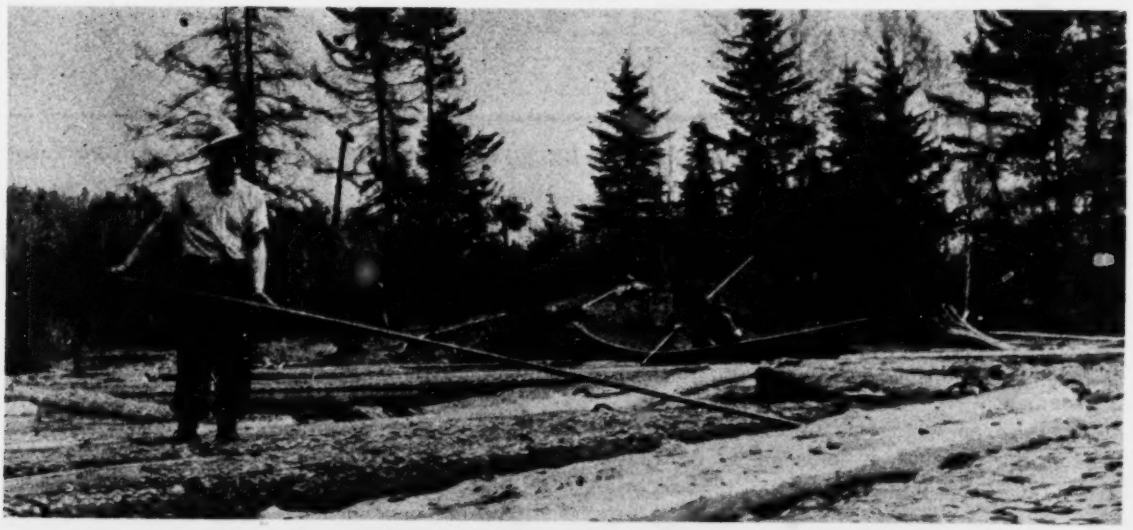
Also included in these new amendments is one requiring that most cranes used to load or discharge cargo from a ship must have an effective load-indicating device.

Another requirement calls for cargo containers to be permanently marked with their empty weight, cargo capacity and total maximum gross weight. In addition, the amendments also contain provisions covering the actual weight of containers, including random sample weight checks.

What's the future for the stevedoring industry? According to MAXIE's Alff, it cannot continue without substantial reductions in its accident and injury experience.

"We in the stevedoring industry are fighting for survival," he told an OSHA-sponsored trade association meeting early this summer. "We cannot continue to support the astronomical cost of injuries."

Yet he believes that the rewards of an all-out extensive safety campaign for the longshoring industry are "stupendous," including better employee relations; the prevention of pain, suffering, the many other hardships associated with injuries; lower insurance costs; and finally, he adds, the loss of target industry status. □

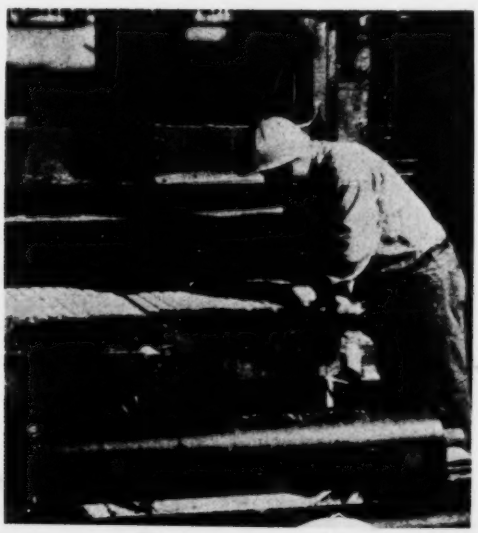


The acrobatic skills of the oldtime loggers belong largely to the past, but even today many other hazardous chores in the lumbering industry can be done only by manpower.

Profile of an Industry:

Lumber and wood products

by Florence H. Selden and Nancy Nelson



Many of the operations which make up the logging industry have become mechanized. Illustrated at left is a prest-o-log machine. Unfortunately, what the machine does to wood, it can easily do to men. Caution is essential.

It was down the logging stream
Down along the Chippeway,
There's a silent grave that's visited
By drivers on the way.

Like many of its kind, the lumbering folk song that contains this refrain tells the tale of a hardy, fear-defying lumberman who confronts the dangers of the wilderness and loses his life in the process. The perils of the logging trade—deaths through drowning, through injuries inflicted by falling timber and through fatal saw cuts—are the major themes of these songs.

The industry today is more mechanized, but the dangers have not really diminished. Like his counterpart of the folk songs, the lumberjack of the present is involved in one of the most precarious industries in America.

The lumber and wood products industry, largest of the target industries, is so diversified that the only facet its components have in common is trees. This industry includes not only logging camps and sawmills, but also veneer and plywood manufacturers, makers of prefabricated wood buildings and wood containers, and establishments that treat or shape wood products. But the alarming number of injuries occur primarily in logging camps and in the sawmills.

The injury rates in the lumber and wood products industry, as a result, are well over the national average. According to the most recent figures of the Bureau of Labor Statistics (1969), the injury-frequency rate for all lumber and wood products industries is 34.6 per million man-hours worked, as compared to the national norm for all industries of 14.8. The 34.6 rate is down from 39.5 in 1959. At logging camps, probably the chief site of most accidents in the industry, the 1969 figure is 38.4, down from 66.1 in 1959. But although the overall injury rate of the lumber industry has dropped since 1959, many of the individual industries have experienced increasing injury rates.

The forest, the logging camp and the sawmill are among the most rugged workplaces in the nation and the most difficult to keep hazard-free. Even the floor of the logger's workplace presents perils that no factory worker ever had to cope with. Frequently unstable, it is at times either dangerously slanted or several feet under water. Good housekeeping, essential to any working environment, is vital in this precarious situation. The possibilities of injury are multiplied if the lumberjack, intent on felling a tree, must contend with strewn branches, brush and stones underfoot.

Each tree to be felled, some often of great weight, presents a hazardous situation that must be dealt with individually. Trees are cut to fall to the side on which they lean, but allowance must be made for other factors such as the direction and force of the wind. Even the elementary job of getting out of the way of falling timber requires good judgment, skill and knowledge on the part of the woodsman.

Danger also arises from dead or previously cut timber caught in the branches of standing trees. Appropriately dubbed "window makers," they often come crashing down unexpectedly, crushing everything in their path—including the unwary worker. Mud also increases the casualty list. It strains the cables used to haul timber to the roadway and increases the danger of breakage.

One safety expert aptly commented, "Into this booby-trapped environment the lumberjack comes with his chain saw, ripe for being clobbered by falling timber, or tripping and falling, and in both cases being sawed as well—unless he recognizes his environment, respects it, is sensitive to it and does something about it."

Technology has understandably been unable to replace manpower in many aspects of the logging industry, but it has also failed to improve on the safety features of the lumberjack's most frequently used tool—the chain saw. This implement has no guard, and the woodsman is in constant danger of injuries from the cutting edges of the saw. A recently developed "anti-kickback" design for chain saws, even though it limits productivity, is a step on the way to reducing the danger.

Besides the sharp cutting blades used by the lumberjack, the automated equipment that has invaded the forests—the bulldozers, crawlers, loaders, skidders and rotobooms—is so sharp and

continued

Mrs. Selden is a free-lance writer. Miss Nelson is on the staff of the publications division, OSHA.

powerful that the use of guards, gloves, belts, hard hats and safety boots is vital for the protection of the logger.

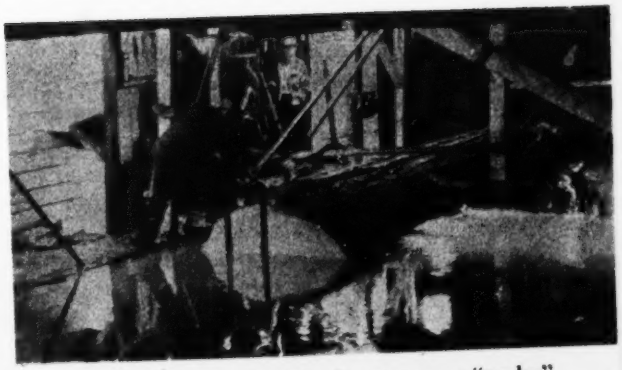
The sawmill, an old American landmark, is the next locale in processing lumber. Early water-powered mills that appeared on the eastern seaboard in the eighteenth century turned out lumber for ships, wagons, furniture and barrels. The mills, however, followed the people west, and since 1938 far western companies have led in annual lumber production. The migration was reversed in recent years as the south began to expand its soft plywood production. More than 36.8 billion board feet of lumber was produced in the United States in 1969, about one-fourth of the world's supply.

Sawmills, like logging camps, are hazardous places. The men handling logs may be struck by moving timber or by traveling or runaway log carriages. They may come in contact with the headsaw or its drive mechanism, or be struck by flying splinters, knots, debris or even dislodged cutting tips of the saw blade itself. The operator, usually working in line with the saw, is directly in the path of these flying projectiles, some traveling at speeds of 120 miles per hour.

The highest severity rate in the mill is found in edging operations where boards are sawed to desired widths, typically by circular saw blades mounted on a mandrel or arbor. Usually lumber is power-fed to the blades by pressure-feed rolls. Injuries are frequent: the most common are crushed fingers, hands or arms in feed rolls, while the most serious are kickbacks.

The great age of some of the sawmills still in operation adds to the working risks. Good walking surfaces and guards on the machinery are badly needed. Raised platforms above cutting operations often lack protective railings. The work atmosphere is aggravated by the excessive noise level of the saws and planers and by the higher level of dust in the air. Electrical hazards are common: bad or inadequate wiring, poor location and guarding of control switches, and the failure to ground individual machines properly.

After the timber is cut into planks, other hazards arise. The lumber is usually stored by stockpiling it in yards. To save space, forklifts are often used to stack the wood, frequently to unstable heights.



At the drag saw (above) the scaler measures a "peeler" cut from a saw log. The slippery terrain underfoot increases the hazards.

Unsafe in any kind of wind, the piles of lumber topple easily. Safety equipment of any kind is useless to the unfortunate worker caught in such a crush.

The high rate of injuries in the lumber business can be diminished, but first it is necessary to take into account the difficulties unique to lumbering. The logger himself presents one obstacle. A rugged man, he has rejected indoor work in favor of exposure to the forest and working in all kinds of weather. Accustomed to physically demanding as well as dangerous labor, he tends to scoff at safety procedures that may slow him down. Strength, skill and knowledge are not always joined by caution and good judgment on his part.

As a result, many injuries can be traced to unsafe actions on the part of the worker. A representative of the National Pulp Association observes, "While he is quite likely to be aware of the safe way to do things, he is, unfortunately, often inclined to take unsafe 'shortcuts'—a never-ending series of gambles in which he feels that his skills can overcome inherent danger."

Similarly, a compliance officer from the Nashville area relates how he rarely finds workers in sawmills wearing eye protection around the saws. Because of the dangers of fallings logs in the mill, hard hats and protective foot wear are also standard—but again the officer rarely sees either of these in use at the mills he has recently inspected. Consequently he feels that one deep-rooted problem that management must overcome is employee indifference to safety procedures.

"Into this booby-trapped environment the lumberjack comes with his chain saw, ripe for being clobbered by falling timber, or tripping and falling, and in both cases being sawed as well—unless he recognizes his environment, respects it, is sensitive to it and does something about it."

If the employee often has been nonchalant about safety, his unions too seem not to have pressed the issue vigorously. Recently the Department of Labor surveyed 20 union agreements covering 1,000 workers. Six of these contracts do not mention safety measures at all, while the remainder contain a variety of safety clauses. Some contracts simply contain vague statements that safety practices should be employed. Only five out of the 20 include specific statements that the employee failing to comply with safety regulations would be penalized.

High hazard industries such as lumbering can be performed safely, and some companies—the Weyerhaeuser Corporation for example—have the safety records to prove it. Recently one of their plants completed 14 months, or 1.4 million manhours worked, without a single lost time injury—probably an unprecedented accomplishment in the lumbering field. This company's successful formula combines a safety program tailor made for the individual plant, good equipment and people assigned to the job of safety. But the achievements of a large corporation in the safety field are one thing—that of a sawmill with only five employees is another.

The small size and widespread location of the majority of logging crews and sawmills is another problem in upgrading safety programs in the lumber industry. Operations involving eight employees or fewer have poorer injury records than the larger plants. It is here that the push for greater safety awareness must be focused, but unfortunately this is exactly the area exhibiting the most inertia in regard to safety.

One southern compliance officer finds that one source of trouble is simply lack of knowledge on the part of the management of smaller operations. He notes that many of the smaller establishments formerly had "no safety people to point out the hazardous conditions to them." Even when hazards are brought to their attention, management is often at a loss as to how to eliminate them.

And a west coast spokesman for the Forest Industries Council points out a communications problem when he describes the difficulties of reaching the independent operator in this fragmented industry. "How do you persuade a small operator whose plant has never had a major accident that his self-interest requires him to observe prescribed safety standards?" he asked. "That employer is sure his luck will hold and his employees will never experience serious injury."

One of OSHA's objectives in designating the target industries was to prod them into setting up high-level committees to deal as rapidly as possible with their high injury rates. The lumber industry responded almost immediately to OSHA's challenge by forming a coordinating committee under the Forest Industries Council. This committee is working on developing new standards to augment those of the initial series formulated by OSHA. The committee's investigation includes standards for wood storage yards, silvicultural operations and pressure treatment of wood, which may eventually become part of OSHA's standards.

The Forest Industries Council is also preparing a guide in conjunction with the Department of Labor and the National Safety Council. Directed toward supervisors, the guide sums up what the safety law means to them and discusses specific standards considered to have top priority by the industry. This simplified version of the safety standards hopefully will help the industry speed compliance with the most pressing aspects of the Occupational Safety and Health Act.

If the effort proves successful in convincing both supervisors and their employees that safety is a vital concern, a drastic reduction in injuries should result. The death-filled lyrics of lumbering folk songs will then no longer be applicable to the present, but more properly, only a testimony to the past. □

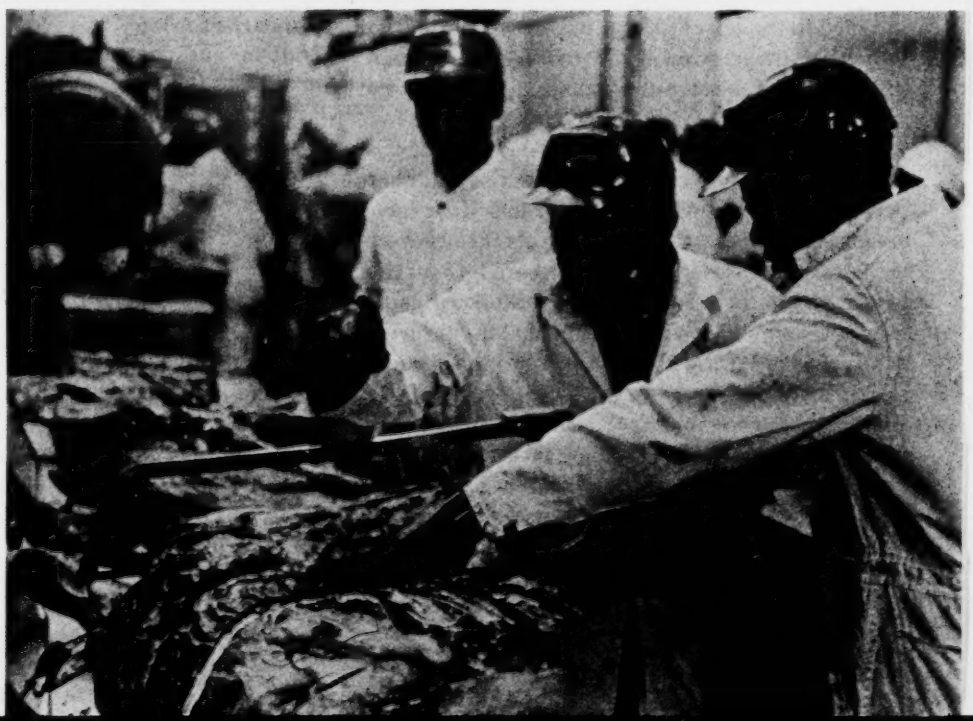
Profile of an Industry:

meat and meat products

by Jim Champagne

One would seriously doubt that an industry which is grouped under the Standard Industrial Code classification of Food and Kindred Products could be a hazardous line of work for a significant number of American employees. After all, Meat and Meat Products (SIC 201) is an industry

Mr. Champagne is branch chief, editorial section, Office of Information Services, OSHA.



Apprentice is being taught how to use a hand saw safely on a portion of meat. Safety helmets and steel mesh gloves minimize the possibility of injury.

whose major goal and accomplishment is to provide sustenance for a large portion of this country's population. Yet this industry is not merely what it provides. Even a brief description of the workplace illustrates this point.

It is an industry concerned with killing-floors and blood-pits. Its employees may have the occasion to use head-splitters, snout-pullers and jaw-pullers, as well as band saws and cleavers during the various stages of processing animal carcasses. The worker is subjected to sudden temperature changes when entering and leaving refrigerated areas. He may also find it necessary to lift heavy carcasses from one area to another. More than likely, during the course of the day, the worker will use a butcher knife—the razor-edged sharpness of which is a necessary quality. Grease, animal fat and water combine to make walking surfaces treacherous; and finally, carcasses suspended on both stationary and moving hooks make the wearing of hard hats a necessary precaution.

Hazardous Environment

This is a skeletal description of the work environment for most meat slaughtering and/or processing plants in this country. To be sure, it is not a hazard-free environment. As one association executive has put it, "The tools we have are made to cut flesh. Unfortunately, this is exactly what the butcher is made of."

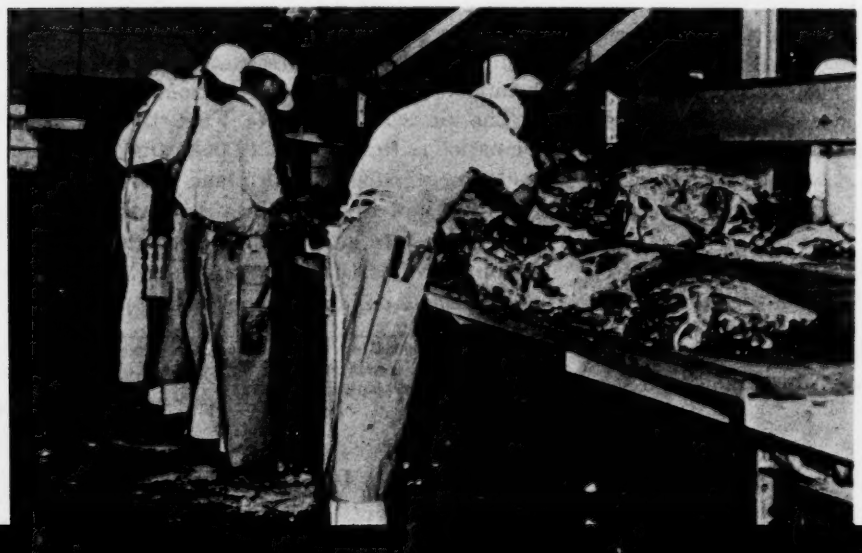
Even a cursory glance at the injury-frequency rate for the meat products industry over the past 10 years indicates that not only is it not hazard-free, it is probably more hazardous than most American industries. The desired turnabout in the injury-frequency rate is possible only through a combination of good judgment, strict adherence to well thought-out and thoroughly tested job-method procedures, and the involvement and commitment of both management and labor.

Knife Cuts Common

Donald MacKenzie of the American Meat Institute argues that even by applying the existing standards, there can be no guarantee that the injury-frequency rate would go down. He states that, "Nothing is said in the FEDERAL REGISTER about the things we have problems with—in particular, knife cuts. The only way we can prevent a knife cut is to wear protective gear. This requires that each production worker demonstrate good judgment and safety awareness. However, since most knife cuts are not severe injuries—in spite of the fact that these injuries keep our frequency rates at a high level—both union and management in many instances do not give much attention to the problem. It would appear then that safety is just not a priority item."

This is not meant to be an across-the-board criticism of all the companies involved with SIC 201, since some companies within the industry have exemplary safety records for the very reason that management and labor are involved with the issues of occupational safety.

Two of these companies are Peter Eckrich and



Workmen remove bones from various cuts of meat. Despite protective hard hats and steel mesh gloves, which indicate that the workers are safety-conscious, the presence of animal fat on the floor creates the hazard of slipping.

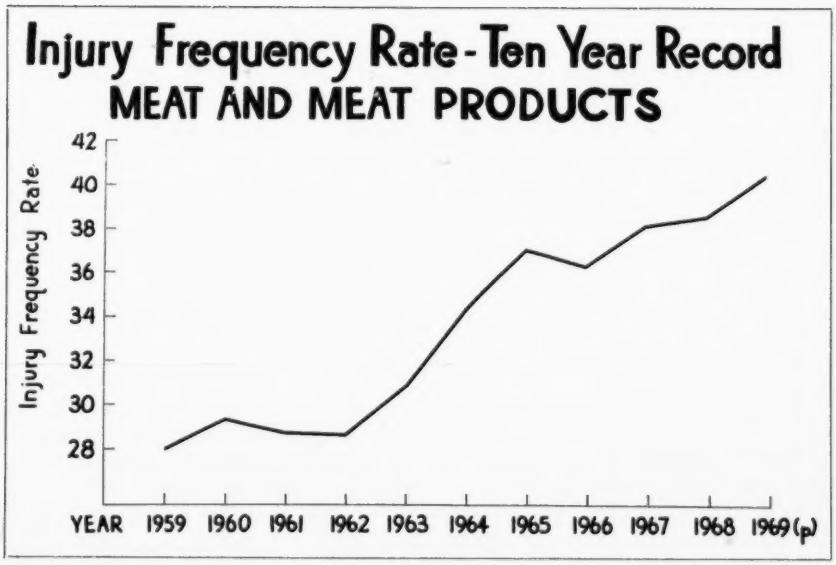


Chart at left illustrates sharp rise in injury-frequency rate over a 10–year period.

Bureau of Labor Statistics

Sons, Inc., and Oscar Mayer and Company. Statistics available at the Eckrich office in Fort Wayne, Indiana, show injury-frequency rates ranging from a low of 1.28 per million man-hours worked for one of the firm's plants to a high of 12.8 for another. Figures from Oscar Mayer and Company reveal an average injury-frequency rate of 15.2. In both cases, these companies are substantially below the industry's overall rate of 40.4 for 1969.

Mr. Chal Borne of Eckrich and Sons, Inc., attributes the success of their safety program to the fact that the issue of safety is sold from the top down. "Management," he says, "is aware that safety is a boring subject and needs constant promotion. We endorse and encourage good housekeeping programs and we offer safety awards to successful departments. The whole concept of safety is given weekly attention in the plant's news sheet, and monthly meetings are conducted on safety education."

Management Involved

At Oscar Mayer and Company, creating safety-conscious employees is a continuing program. "To achieve success in this area," one of the company's executives said, "management must be involved and concerned. This has always been the policy of Oscar G. Mayer, Jr." Weekly safety reports are issued. A rotating safety committee with representatives of the labor force, supervisors and management was formed early in the company's history.

It would appear that the real problem regarding safety is not in developing new methods or even in developing new programs. Rather it is a problem of informing and alerting all companies of common hazards and of making these companies aware of existing methods to cope with the hazards.

The National Safety Council has made available a kit on how to start a safety program. Conceivably it could go far toward reducing the number of injuries in all industries.[1] Mr. Raymond Smith of the National Safety Council describes the kit as being "an important first step in any attempt by companies to overcome occupational hazards."

The kit is in four parts. First, there is an explanation as to why a safety policy must be posted and promulgated in each plant. The second step describes how to choose a safety director. Third, instructions are given on how to conduct a housekeeping and safety evaluation for each plant. Finally, methods on beginning a training program for

1. Inquiries concerning the kit should be directed to branch chief, editorial section, Office of Information, OSHA, 1726 M Street NW., Washington, D.C. 20210.

"The tools we have are made to cut flesh. Unfortunately, this is exactly what the butcher is made of."

employees are discussed. The point to make is that information like this already exists and has existed for quite some time. Yet, high injury-frequency rates, rather than being the exception, are the hallmark of many American workplaces.

Meat industry statistics show a 10-year increase in the injury-frequency rate from 28 in 1959 to 40.4 in 1969. Statistics, of course, can be misleading. Both industry and labor might justifiably argue that current figures do an injustice to companies working in the area described by SIC 201.

On the one hand, industry might question whether or not the whole picture of job safety is being adequately reckoned with because of the imperfect sampling used to obtain the above statistics. They would argue that the figures are not representative of the total complex of work situations within the meat industry.

On the other hand, they might attempt to mitigate the problem by stressing the fact that the industry has a comparatively low severity rate.

The biggest hazard in the production operation is a knife cut. And while there are many cuts, two things should be kept in mind. In the first place, most injuries of this type are not severe, but nonetheless have to be reported. Secondly, many companies follow the policy of not allowing a worker to return on the job until the wound is completely healed. This is particularly true of hand cuts, since the worker is dealing with a product to be consumed by the general public. Other available figures seem to support this interpretation. The latest National Safety Council statistics show that out of 1,092 reported injuries, the highest percentage of accidents involved cuts.

Employee representatives might argue that the statistics are misleading for quite different reasons. They would say that the figures fail to include all applicable accident reports, and that this failure results in a substantially lower injury-frequency rate than would be revealed by more accurate reporting. They feel that management, especially in smaller companies, will not act unless confronted with catastrophic figures which demand attention.

The whole question of statistics, however, is moot. Although debate might be desirable and might resolve some important issues as well as settle some outstanding complaints, the passage of the Williams-Steiger Act underscores the fact that a large number of American workers can ill afford to wait. However imperfect the available statistics are, they show that people are getting hurt needlessly. Unfortunately, as compared with other industries, this is especially true of the meat and meat products industry as evidenced by its injury-frequency rate of 40.4 for 1969, compared to a rate of 14.8 for all manufacturing.

Injury Rate Doubled

Such statistics can not be completely denied. Still there are legitimate explanations that tend to show that the problem was unexpected and is both temporary and curable. One such explanation was recently offered by Donald MacKenzie of AMI who said, "We are not able to explain just what has caused the industry's injury-frequency rate to double after having been in the 19 to 22 range during the first half of the fifties. We suspect it may have been partly an unexpected result of the trend toward smaller plants and decentralized operating controls which began in the mid-fifties and has continued to date."

The industry from a geographical point of view is widespread. Taking into account the fact that of the approximately 15,000 companies covered by SIC 201, only about 10 percent are affiliated with one of three major trade associations—the American Meat Institute, National Independent Meat Packers Association and the Western States Meat Packers Association—there are a considerable number of small companies employing from 10 to 50 people that may not have ready access to information concerning safety.

Perhaps, after all the dust has settled, we will find that safety involves both being informed and using that information effectively. As one company executive put it, "Accidents are expensive, and in that sense, I believe that it is high time that American industry become thrifty." □

Profile of an Industry:

mobile homes

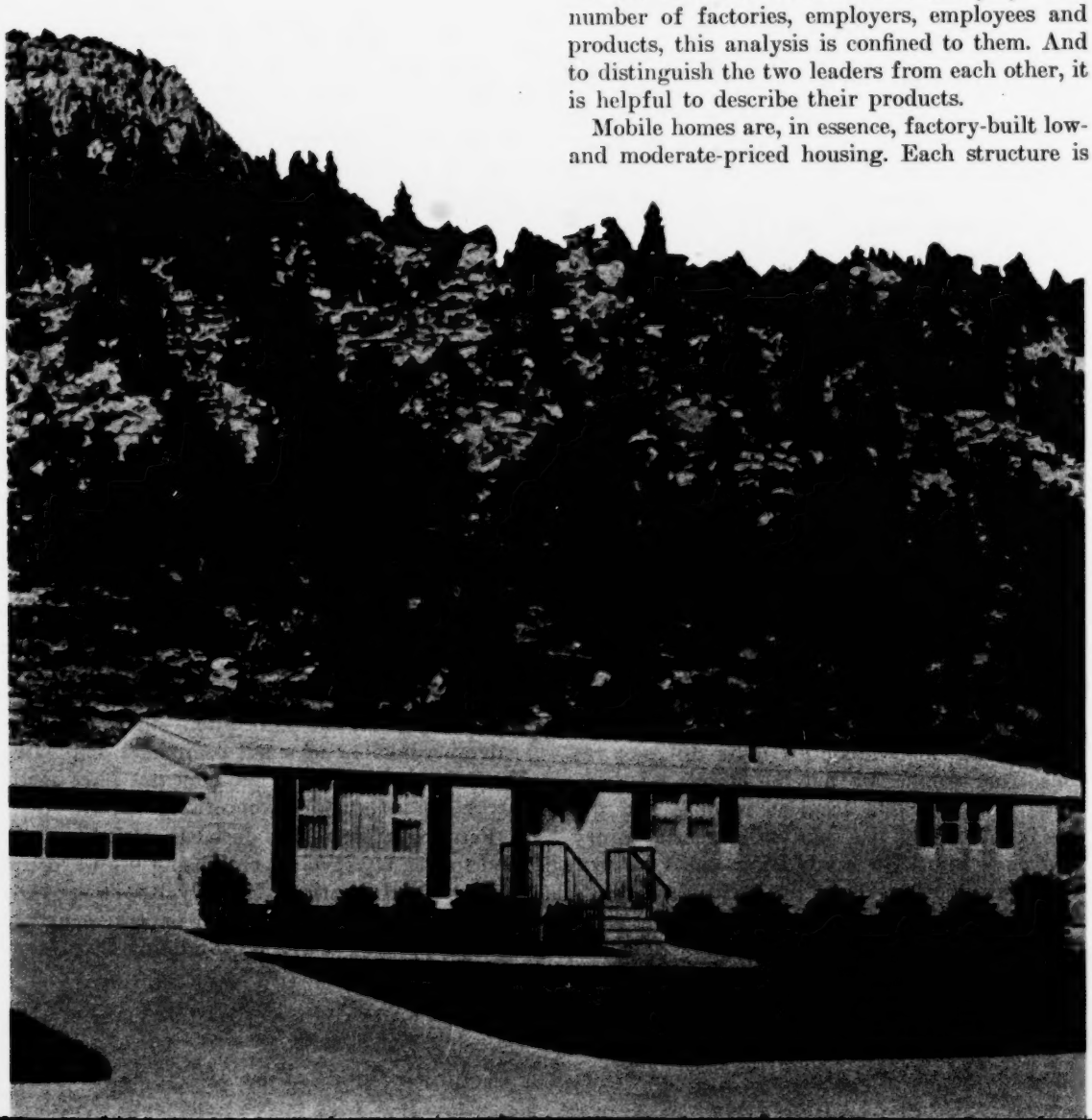
and transportation equipment

By Florence H. Selden

Standard Industrial Classification #379—"Miscellaneous Transportation Equipment"—is an umbrella under which three principal industries are grouped by the Bureau of Labor Statistics. The three types of products are: (1) mobile homes; (2) recreational vehicles; and (3) snowmobiles.

Because the first two lead the industry by far in number of factories, employers, employees and products, this analysis is confined to them. And to distinguish the two leaders from each other, it is helpful to describe their products.

Mobile homes are, in essence, factory-built low- and moderate-priced housing. Each structure is



at least eight feet wide and 32 feet long—so large it must be commercially transported by either truck or railroad flat car. It is often finally attached to a permanent foundation. Reliable estimates show that 95 percent of mobile homes are used as primary residences.

Recreational vehicles, by contrast, are lighter-weight luxury trailers, designed for temporary or vacation living. Divided by their manufacturers into four categories (travel trailers, pickup truck campers, camping trailers and motor homes), these vehicles range in length from six to 35 feet, and are built to be towed behind passenger cars without a special highway permit.

The construction of mobile homes became a sizeable industry around 1930, then began to boom following World War II when low-cost housing was needed quickly and urgently. By 1956 the demand for luxury travel trailers had grown so large that the building of these recreational vehicles became a separate branch of the industry. The great distinction between the two operations is their appeal to totally different markets. They also differ in the materials they utilize. However, some of the larger companies manufacture both types of vehicles.

Mobile homes are basically wood structures, containing four to six rooms, centrally heated, and sold fully furnished and equipped. They cost from $4,000 to $18,000, depending on the furnishings and appliances.

Recreational vehicles are constructed of prefinished sheet aluminum or fiberglass, sometimes including canvas or pliable plastic as well. They cost from $200 for a simple pickup truck camper to $18,000 for a fully equipped luxury travel trailer.

The essential function of a manufacturer of mobile homes or recreational vehicles is to assemble the parts and fashion the shell of a moveable home. Manufacturers of these dwellings do not customarily fabricate the parts they assemble, and the factories are therefore not subject to the safety hazards of the component industries.

In 1969 (latest BLS figures available) there were 335 employers in the entire industry. For 1971, the industry's trade associations estimate that there are 1,200 employers. From 1961 to 1969, industry production increased 500 percent; but in 1970 the tightened U.S. economy caused a decrease of 8.2 percent.

Mrs. Selden is a free-lance writer who has written on the subjects of health and safety.

"It's a young, booming industry. Even some of the larger employers have not had an accident-prevention program."

Statement by a safety adviser.

A meteoric rise in the number of those employed manufacturing all types of miscellaneous transportation equipment is indicated in a comparision of BLS figures from 1964 through 1969:

Year	Number of Employees
1964	38,800
1965	43,900
1966	51,300
1967	50,900
1968	62,900
1969	88,200

This industry has not been highly organized by labor unions. Many of the plants employ only 25 to 50 persons, a fact which could account for the limited union activity. Major unions represented include the International Union of Electrical, Radio and Machine Workers, the International Association of Machinists and Aerospace Workers, and the United Steelworkers of America. Even where union contracts exist, the safety provisions are general and administrative; little reference is made to safety rules for specific work situations in the collective bargaining agreements.

The number of disabling injuries per million man-hours worked has been higher than the national average for many years. But this rate has also grown from 1964 to 1969, as the chart indicates. (See p. 18.)

The picture emerges of an industry composed mainly of small firms, with many new employers and employees, and a rapid increase in facilities and production. (Of course, there are some larger, better-known manufacturers such as Boise-Cascade, Frontier Industries and Vindale Corporation.) New, small firms undergoing rapid expansion of necessity hire inexperienced, unskilled employees who require extensive training in the safe use of equipment and materials.

Employers who are themselves new to the field are unaware of all the safety precautions necessary,

"This is a 'customized' type of work, using lightweight equipment and materials. In the smaller factories which predominate, you don't get a feeling of sturdiness."
Statement by an OSHA compliance officer.

or of the time and perseverance required to train unskilled employees.

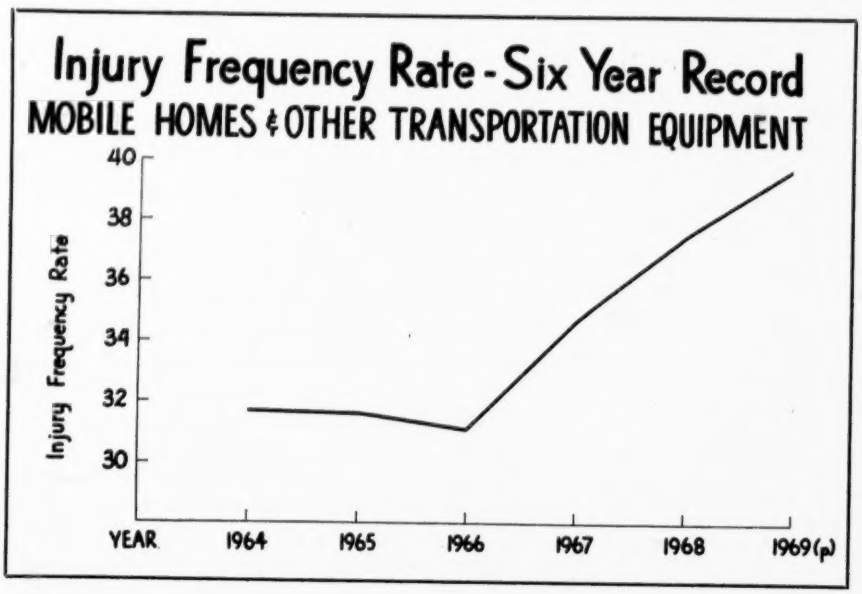
Hasty expansion has also encouraged the use of second-hand equipment which is often worn and may not lend itself easily to safe operation.

Many employers have never had a clearly defined safety program or staff safety officer. Up to now, accident-reporting was a purely voluntary activity which did not seem to call for great expertise, and was therefore done by someone for whom it was not a primary responsibility. The reporting of injuries may have been incomplete, possibly even inaccurate. It is possible that some factories with good safety records may not have thought it necessary to report at all; perhaps only the bad news got into the records. In any case, most employers are incredulous that their industry has such an inordinately high injury-frequency rate as the BLS figures indicate.

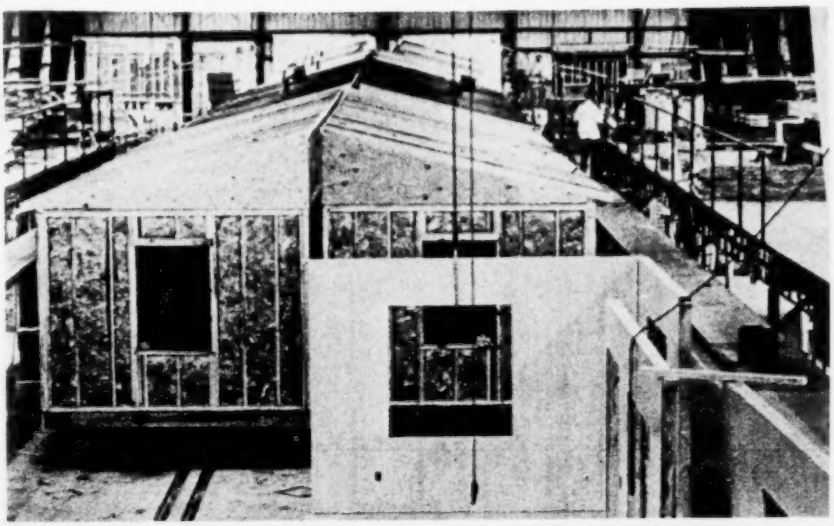
With the passage of the Occupational Safety and Health Act of 1970, manufacturers of mobile homes and recreational vehicles are, for the first time, federally mandated to provide employment "free from recognized hazards causing or likely to cause death or serious physical harm." For violation, an employer may receive a citation and a financial penalty. Employers are required to maintain accurate records and submit periodic reports of work-related deaths, injuries and illnesses.

At the present time, the manufacture of mobile homes and recreational vehicles is not known to cause occupational disease. The major concern is to discover and correct the hazards causing the high rate of accidental injury. The causes are not listed in available reports; and it is too soon to have factual information from the new OSHA compliance officers. But interviews with trade association and union representatives and with experienced Labor Department inspectors produced some educated guesses.

A compliance officer said: "I believe there is a high incidence of slips and falls, since this is not a highly automated industry." Another added: "There is often an absence of firmly supported work platforms. This industry requires employees



Dramatic upswing in injury-frequency rate shown in the chart is due to increase of new employers and employees and rapid increase in facilities and production.



This picture shows how a mobile home similar to the one on page 16 is manufactured.

to work at a second-story level, and you often see them standing on insecure ladders from which they can slip and fall."

A union official stated: "In an industry that grows so fast, both the employer and employee are concentrating on increasing production. There isn't too much regard for safety."

An industry spokesman said: "These small manufacturers who need workers quickly must hire the least skilled and trained workers from low economic and intellectual levels. These employees often cannot (sometimes will not) understand and utilize proper safety procedures—such as face helmets or machinery guards." Another representative said: "It is possible that drugs and alcohol play a part in causing accidents. There is no reason to believe the blue-collar community is totally free of these problems."

The miscellaneous transportation equipment category is probably best illustrated by this travel trailer, the most popular of recreational vehicles.

A BLS official said: "An industry that doubles its employment in five years has new, inexperienced employers and under-trained and possibly overworked employees. Probably the physical plant is also overtaxed, and storage facilities may be pushed beyond their normal endurance. All of these conditions are possible sources of accidents."

Action by Industry

In response to Assistant Secretary Guenther's request that the industry submit plans for increasing safety precautions and decreasing its injury-frequency rate, the Mobile Homes Manufacturers' Association and the Recreational Vehicles Institute agreed to undertake a number of programs, as follows:

1. To identify the hazards and verify the number of accidents, questionnaires have been circulated to members of the two trade associations;
2. To inform employers of the high accident rate and educate them about the need for reform, pamphlets are being prepared for distribution and articles prepared for the trade press;
3. Additional safety standards for the prevention of accidents are being developed;
4. Closer liaison with the American National Safety Institute is expected to help improve in-plant safety operations;
5. Safety experts are being sought throughout the industry to become a standing committee for the assistance of all employers. □

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